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KNOWLEDGE LEVEL OF FRUIT-VEGETABLE AND CONSUMPTION DURING PANDEMIC COVID-19 AND ITS IMPACT ON CONSTIPATION AMONG TEENAGERS IN SMAN 1 DEPOK

Tingkat Pengetahuan Buah-Sayur dan Konsumsi selama Pandemi Covid-19 dan Dampaknya pada Konstipasi pada Remaja di SMAN 1 Depok

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ABSTRACT

Fruit and vegetable (F&V) consumption among teenagers in Indonesia is still relatively low. Based on Indonesia Basic Health Survey in 2018, 96.4 percent of teenagers have a low intake of F&V and this can increase the risk of constipation. The purpose of this study was to assess the level of knowledge and F&V consumption pattern and the impact on constipation at SMAN 1 Depok. The research design was cross-sectional with 206 high school students as subjects taken by proportional random sampling. Data was collected through an online questionnaire and tested statistically with Chi-square and Fisher-exact tests. The proportion of teenagers with a good level of knowledge is only 8.3 percent, while the others are moderate (55.8%) and not-good (35.9%). The average amount of F&V consumption was 132.4±96.5 grams/day and 95.1 percent consumed less than the recommended amount. The average fiber intake was 6±2.5 grams/day, lower than the recommendation. It was found that 29.6 percent of teenagers were constipated. There was a significant relationship between F&V consumption and F&V accessibility (*p*=0,016), as well as constipation with gender (*p*=0,021) and fluid intake (*p*=0,027). Almost all teenagers have low consumption of F&V and fiber intake and gender were found to be the dominant factor in constipation. It is recommended for the school to carry out continuous socialization for the students and parents about balanced nutrition, especially the importance of consuming 3 – 5 servings of F&V a day.

Keywords: fruit, vegetable, teenagers, balanced diet, fluid intake

ABSTRAK

Konsumsi buah dan sayur pada remaja di Indonesia cenderung rendah. Berdasarkan Riset Kesehatan Dasar tahun 2018, 96.4 persen remaja memiliki konsumsi buah dan sayur yang rendah dan hal itu dapat meningkatkan risiko konstipasi. Tujuan dari studi ini adalah untuk menilai tingkat pengetahuan dan pola konsumsi buah dan sayur dan dampaknya pada kejadian konstipasi pada remaja di SMAN 1 Depok. Desain studi adalah cross-sectional dengan 206 siswa SMA sebagai subjek diambil menggunakan *proposional random sampling*. Data dikumpulkan melalui kuesioner online dan diuji secara statistik dengan tes Chi-Square dan Fisher-exact. Proporsi remaja dengan tingkat pengetahuan baik hanya 8.3 persen, sedangkan yang lainnya cukup (55.8%) dan kurang baik (35.9%). Rata-rata konsumsi buah dan sayur yaitu 132.4±96.5 gram/hari dan 95.1 persen mengonsumsi kurang dari jumlah yang direkomendasi. Rata-rata asupan serat yaitu 6±2.5 gram/day, lebih rendah dari anjuran. Ditemukan 29.6 persen remaja yang konstipasi. Ada hubungan signifikan antara konsumsi buah dan sayur dan aksesibilitas buah dan sayur (*p*=0,016), begitu juga dengan konstipasi dengan jenis kelamin (*p*=0,021) dan asupan cairan (*p*=0,027). Hampir seluruh remaja memiki konsumsi buah dan sayur dan serat yang rendah dan jenis kelamin ditemukan sebagai faktor dominan konstipasi. Direkomendasikan untuk sekolah agar melaksanakan sosialisasi secara terus menerus bagi siswa dan orang tua siswa terkait dengan gizi seimbang khususnya pentingnya konsumsi 3–5 sajian buah dan sayur per hari.

Kata kunci: buah, sayur, remaja, gizi seimbang, asupan cairan

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INTRODUCTION

Consumption of fruit and vegetable (F&V) is one of the important points in the Indonesian Balanced Nutrition Guidelines and is one of the focuses in the Indonesian Healthy Living Community Movement (Gerakan Masyarakat Hidup Sehat).[1] F&V are sources of vitamins, minerals, dietary fiber, and phytochemicals.[2] Previous studies have shown that F&V consumption is associated with the incidence of non-communicable diseases (NCD) such as gastrointestinal inflammatory disease, hypertension, cardiovascular disease, and diabetes mellitus, associated with micronutrients, fiber, and antioxidants that contained in F&V. [3, 4, 5] Micronutrients and antioxidants are beneficial in inhibiting the oxidation of low-density lipoprotein (LDL) and modulating insulin sensitivity, while fiber is fermented in the intestines into short-chain fatty acids (SCFA) which can help lower cholesterol levels and play a role in the immune system. [5,6]

Globally, China was the highest F&V producing country in 2019, while Indonesia was the 7th highest fruit producing country.[7] The 2019 Food Balance Sheet showed that cabbage and tomatoes are several types of vegetables with the highest availability per capita which is 13.68 grams per day and 10.23 grams per day, while the highest availability of fruit per capita is banana and mango at 73.51 grams per day and 28.5 grams per day.[8] However, there might be a problem of unequal availability in each region. In 2020, Central Bureau of Statistics (CBS) reported that there are 5 highest F&V production, namely bananas, mangoes, oranges, pineapples, salak, mushrooms, cabbage, tomatoes, mustard greens, and carrots.[9,10]

F&V consumption in Indonesia is still relatively low. The recommended amount of F&V intake according to the World Health Organization (WHO) is 400 gram per day or 5 servings of fruit and/or vegetable per day, while the Indonesian Ministry of Health, in the Guidelines for a Balanced Food Diet, recommends 400-600 gram per day for adolescents and adults or 3 – 4 serving of vegetables and 2 – 3 serving of fruit per day.[1, 11] However, the Indonesian Basic Health Survey in 2018 reported that the proportions of Indonesian people who consumed F&V less than the recommendation one was still very high, namely 95.4 percent and 96.4 percent for the teenagers aged 15 – 19 years.[12] The 2014 Individual Food Consumption Survey reported that the average F&V consumption in Indonesian teenagers was 169.3 grams per individual per day or in other words reached 43.2 percent of the recommended amount.[13] A study by Darfour-Oduro in 2018 on F&V consumption among adolescents in low and middle-income countries showed that only 16.4 percent of adolescents in Indonesia met the WHO recommendation for daily intake of F&V.[11] Compared to other East Asian countries, the proportion of Indonesian adolescents who meet WHO recommendation is still below Thailand (24.0%) and Malaysia (18.8%).[11]

F&V consumption pattern can be caused by various factors, including internal factors and external factors. Previous studies stated that several internal factors related to F&V consumption include gender, preferences, and knowledge.[14-16] Study on adolescents in Indonesia showed that girls are more likely to consume more F&V.[14] A study on teenagers in Jakarta showed that teenagers who had a good F&V preference had a higher average intake of F&V.[15] In addition, nutritional knowledge is related to consumption of F&V where the higher the nutritional knowledge of teenagers, the higher the consumption of F&V.[16]

External factors occur from the individual's environment that form habits, for instance, the influence of parents or family, the influence of peers and the accessibility of F&V. [14,17] Parents or family have a role in shaping children's eating behavior from an early ages, the more often children are exposed to various types of F&V, the more children like F&V.[15] Parents also play a role in providing various types of foods for their children, including F&V.[14] Moreover, teenager food choices are also influenced by their peers related to their desire to be fitted and accepted by their peer groups.[18] While F&V accessibility is the bridge between F&V availability and consumption, accessibility gives parents the ability to provide F&V at mealtimes.[17,19]

The low consumption of teenagers needs to be a concern considering that F&V consumption is important for health. Dietary fiber from F&V, is needed to maintain a healthy digestive system.[5] The fiber content is in the range of 1.2 – 4.0 per

100 grams for vegetables and in the range of 2.0 – 14.8 grams / 100 grams for fruit.[5] Meanwhile, fiber needs based on the 2019 Recommended Dietary Allowances for teenagers aged 16 -18 years are 29 grams per day for girls and 37 grams per day for boys.[20] Research in Turkey showed that low fiber and fluid intake was associated with a high incidence of constipation, while a study in Semarang (Central Java, Indonesia) also showed the same incidence in teenagers who lack fiber and fluid intake. [21,22]

Many changes have occurred during the COVID-19 pandemic, one of which is the online school learning methods. A study on teenagers in Indonesia stated that they felt a change in their diet during the pandemic, they felt the need to maintain their immune system, were unable to buy snacks outside the home, and consumed more food that was cooked by themselves.[23] Suggestion to reduce activities outside the home lead to limited access for teenagers to obtain food from outside the home and more dependent on food provided at home. This research was conducted with the aim of assessing the level of knowledge and F&V consumption pattern, and the impact on constipation in teenagers.

METHODS

The research was conducted online during the pandemic period, from February to March 2021 at SMAN 1 Depok, West Java. The research has been approved by the Jakarta II Health Research Ethics Commission, #LB.02.01/I/KE/31/188/2021. Eligible subjects are active students grades 10 and 11, aged 15-17 years, willing to be respondents, not vegetarian, and not suffering from colon cancer, diabetes mellitus, and hyperthyroidism. The number of subject is 241 which calculated based on the Lemeshow formula taken by proportional random sampling. At the end of the study, 206 subjects were able to completed the data and 34 subjects dropped out (Figure 1).

The data was obtained by filling out the questionnaire directly by the subject through the Google Form. The characteristic data includes gender, age and preferences for types of F&V. The preference data was obtained through open-ended questions. Preferences were categorized as like (at least 6 types of F&V) and dislike.[24]

Information on the role of parents was obtained through 6 questions, such as the F&V that parents consumed when they were with their teens at home and restaurants and the advice given to eat F&V, while information on the role of peers when at school and in restaurants. The role of parents and peers is categorized as poor (< median score) and good (≥ median score).[15]

F&V accessibility data includes the availability of sellers, the availability of various types of F&V and their adequacy for the whole family members at home. F&V accessibility was measured by the answers “always”, “often”, “sometimes”, “rarely”, and “never” with a score of 5, 4, 3, 2, and 1. Accessibility is categorized as good if the average score is ≥ 4.[25]

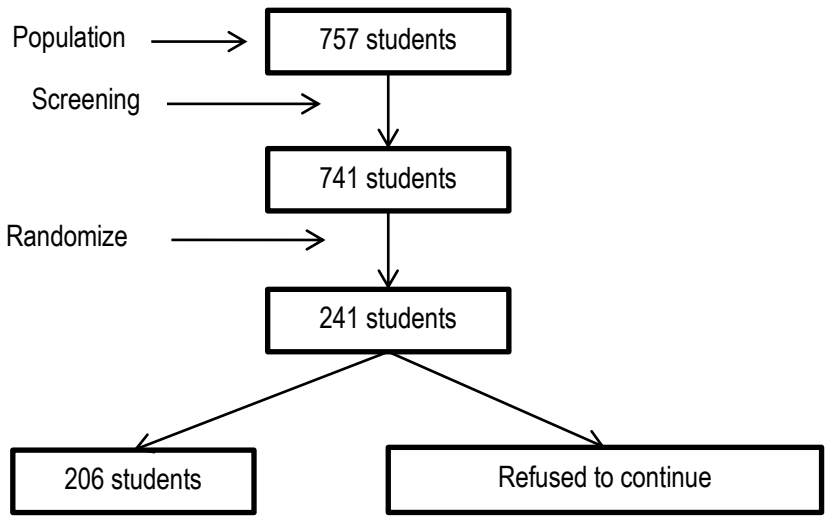

Figure 1
Sampling Profile

Knowledge level was measured through 12 questions related to F&V. The knowledge questionnaire has passed the validity test using the Pearson Product test and the reliability test using the Kuder-Richardson 20 test. The results of the validity test show that 8 questions are valid and 4 questions are corrected and the reliability test results show r=0.520 > r table=0.3203. The level of knowledge is categorized as good (score>80), moderate (score=60-80), and not-good (score<60).[26]

The amount of F&V consumption, fiber, fluids, and probiotic drinks was obtained by the food record method for 5 consecutive days and the results were averaged per day, while the type of F&V consumed in the last one week period was obtained by the method Food Frequency Questionnaire (FFQ).

F&V consumption is categorized based on the recommendation of Indonesian Balanced Nutrition Guidelines and WHO which is 400 grams/day, as well as fluid intake is 2,100 ml per day. [1, 11] While fiber intake is categorized based on the average intake per day, and probiotic drinks are categorized as daily consumption or occasionally.

The occurrence of constipation was measured based on the condition of defecation for 5 consecutive days. It is said to be constipated if it fulfills at least 2 of the 5 symptoms in the ROME III criteria, namely 1) straining, 2) lumpy or hard stools, 3) sensation of incomplete evacuation, 4) sensation of anorectal obstruction, and 5) fewer than 3 defecations per week.[27]

The Chi-Square and Fisher-Exact tests were used to test whether there was a relationship between F&V consumption, the prevalence of constipation and the independent variables with level of significance as *p* value < 0.05. Furthermore, a multivariate test was carried out to determine the dominant factor of constipation using logistic regression analysis.

RESULT

Characteristics, Role of Parents and Peers, F&V Accessibility

The number of subject who completed the data was 206, which most of them were girls (67.0%) aged 16 years old (54.4%) and like F&V (85.4%). The types of vegetables most liked by teenagers were spinach (71.8 %), carrot (66.5%), and *kangkung* (59.7%), while for the fruit were mango (75.2%), bananas (70.9%), and apple (56.3%) (Table 1). The average F&V consumption in the group that dislike F&V was 93 g/day, while for the group that like F&V was 139.1 g/day. Table 2 shows that most teenagers consumed F&V at lunchtime (37.9%), at home (98.5%), and eat with their parents (61.2%). Almost all parents have a good role in the F&V consumption of teenagers (97.1%) by encouraging them and consuming F&V when they were with teenagers at home and restaurant. On the other hand, peers did not play a role or less likely to encourage and consume F&V when they were with teenagers. Most of the teenagers (67.0%) have poor F&V accessibility level.

Table 4 shows that there were still 35.9 percent of teenagers with a low level of knowledge about F&V, with an average score of 61.04 ± 12.69 (min score 20 and max score 85) (Table 3). The questions that teenagers have not mastered and answered incorrectly were related to F&V consumption recommendation (98.1%), visualization of the *"Isi Piringku"* (84.5%), and the recommended amount of fiber intake (79.0%).

Fruit and Vegetable, Dietary Fiber, Fluid Intake, and Probiotic Drink Consumption

The average of F&V consumption was 132.43 g/day (min=3 g/day and max=478 g/day), below the recommended which is 400 g/day. Compared to the recommendation, it appears that almost all of the teenagers have low F&V consumption (95.1%) and only 4.9 percent that meet the recommendation (Table 5). The average frequency of F&V consumption was only 1.79 times/day (F=0.64 times/day and V=1.16 times/day), far from the recommended amount which is 5 times a day. Fiber intake of all teenagers were still below the requirement in 2019 RDA with an average fiber intake of 6 ± 2.5 g/day (min=1.5 g/day and max=14.9 g/day) and average fiber intake from F&V is 2.5±1.7 g/day (min=0.1 g/day and max 7.6 g/day). By 85 percent of teenagers were classified as low intake of fluid with an average of 1,556.8±524.7 ml/day (min=295 ml/day and max=3,330

ml/day). Most of them (92.2%) did not consume probiotic drinks daily and there was one teenager who took laxatives during food recording (Table 5).

Occurrence of Constipation

Using The Rome III criteria as the standard to determine constipation status, the results shows that constipation occurred in 29.6 percent of teenagers in SMAN 1 Depok (Table 6).

Factors Related to F&V Consumption

The results of statistical test, there was a significant relationship between F&V consumption with F&V accessibility (p=0.016). No significant relationship was found between F&V consumption with gender (p=0.303), preference (p=1.000), level of knowledge (p=0.363), and the role of peers (p=0.542) (Table 7). Meanwhile, the role of parents variable cannot be tested because there was an empty cell.

Factors Related to Constipation

The result of statistical tests showed that there were significant relationship between the constipation with gender (p=0.031) and fluid intake (p=0.046). There were no significant relationship between constipation and F&V consumption (p=0.081), level of knowledge (p=0.145), dietary fiber intake (p=0.160) and consumption of probiotic drinks (p=0.480) (Table 8). The results of the logistic regression test showed that gender was a factor in teenager's constipation with OR = 1.951 (Table 9).

Table 1
Characteristics (Gender, Age, Preferences, Most Liked F&V)

Characteristic	n	%
Gender		
Girls	138	67.0
Boys	68	33.0
Age		
15 y.o	57	27.7
16 y.o	112	54.4
17 y.o	37	18.0
Preferences		
Dislike	30	14.6
Like	176	85.4
Most Liked Fruit		
Mango	155	75.2
Banana	146	70.9
Apple	116	56.3
Orange	90	43.7
Grape	79	38.3
Most Liked Vegetable		
Spinach	148	71.8
Carrot	137	66.5
Kangkung	123	59.7
Broccoli	65	31.6
Choy sum	56	27.2

Table 2
The Role of Parents and Peers and F&V Accessibility

Characteristic	n	%
Consumption Habit		
Time of Consumption		
Breakfast	26	12.6
Morning Snack	33	16.0
Lunch	78	37.9
Evening Snack	27	13.1
Dinner	22	10.7
Night snack	20	9.7
Appearance of Others		
Alone	79	38.3
Parents	126	61.2
Friends	0	0.0
Relatives (Sister/Brother)	1	0.5
Place of Consumption		
Home	204	99.0
Restaurant	2	1.0
School	0	0.0
Role of Parent		
Poor	6	2.9
Good	200	97.1
Role of Peers		
Poor	119	57.8
Good	87	42.2
F&V Accessibility		
Poor	138	67.0
Good	68	33.0
Total	206	100.0

Table 3
Average Score of F&V Knowledge

Gender	Mean	SD	Median	Min	Max
Boys	59.93	14.42	60.00	20.00	85.00
Girls	61.59	11.76	65.00	30.00	85.00
	61.04	12.69	62.50	20.00	85.00

Table 4
Level of F&V Knowledge

F&V Knowledge Level	n	%
Not-good	74	35.9
Moderate	115	55.8
Good	17	8.3
Total	206	100.0

Table 5
F&V Consumption, Dietary Fiber Intake, Fluid Intake Level, and Consumption of Prebiotic Drinks

Variables	n	%
F&V Consumption		
< 400 gram/day	196	95.1
≥ 400 gram/day	10	4.9
Dietary Fiber Intake Level		
< 6 gram / day	118	57.3
≥ 6 gram / day	88	42.7
Fluid Intake Level		
< 2100 ml / day	175	85.0
≥ 2100 ml / day	31	15.0
Consumption of Prebiotic Drink		
Occasionally	190	92.2
Daily	16	7.8
Total	206	100.0

Table 6
Occurrence of Constipation

Constipation	n	%
Constipated	61	29.6
Non-constipated	145	70.4
Total	206	100.0

Table 7
F&V Consumption level according to characteristics, F&V Accessibility, Role of Parents and Peers, and F&V Knowledge

Variables	F&V Consumption		Total	p-value
	< 400 gram	≥ 400 gram		
Gender				
Boys	63 (92.6%)	5 (7.4%)	68 (100.0%)	0.303
Girls	133 (96.4%)	5 (3.6%)	138 (100.0%)	
Preference				
Dislike	29 (96.7%)	1 (3.3%)	30 (100.0%)	1.000
Like	167 (94.9%)	9 (5.1%)	17 (100.0%)	
F&V Accessibility				
Poor	135 (97.8%)	3 (2.2%)	138 (100.0%)	0.016*
Good	61 (89.7%)	7 (10.3%)	68 (100.0%)	
Role of Parents				
Poor	6 (100.0%)	0 (0.0%)	6 (100.0%)	-
Good	190 (95.0%)	10 (5.0%)	200 (100.0%)	
Role of Peers				
Poor	112 (94.1%)	7 (5.9%)	119 (100.0%)	0.524
Good	84 (96.6%)	3 (3.4%)	87 (100.0%)	
F&V Knowledge				
Not good	72 (97.3%)	2 (2.7%)	74 (100.0%)	0.336
Moderate	124 (93.9%)	8 (6.1%)	132 (100.0%)	
Total	196	10	206	

*p-value < 0.050

Table 8
Occurrence of constipation according to characteristic, F&V consumption, dietary fiber intake, fluid intake, and consumption of prebiotic drink

Variables	Occurrence of Constipation		Total	p-value
	Non-Constipated	Constipated		
Gender				
Boys	55 (80.9%)	13 (19.1%)	68 (100.0%)	0.031*
Girls	90 (65.2%)	48 (34.8%)	138 (100%)	
F&V Consumption				
< 400 gram	135 (68.9%)	61 (31.1%)	196 (100.0%)	0.081
≥ 400 gram	10 (100.0%)	0 (0.0%)	10 (100.0%)	
Knowledge				
Not good	47 (63.5%)	27 (36.5%)	74 (100.0%)	0.145
Moderate	98 (74.2%)	34 (25.8%)	132 (100.0%)	
Dietary Fiber Intake				
< 6 gram / day	78 (66.1%)	40 (33.9%)	118 (100.0%)	0.160
≥ 6 gram / day	67 (76.1%)	21 (23.9%)	88 (100.0%)	
Fluid intake				
< 2100 ml / day	118 (67.4%)	57 (32.6%)	175 (100.0%)	0.046*
≥ 2100 ml / day	27 (87.1%)	4 (12.9%)	31 (100.0%)	
Consumption of Prebiotic Drink				
Occasionally	132 (69.5%)	58 (30.5%)	190 (100.0%)	0.480
Daily	13 (81.3%)	3 (18.8%)	16 (100.0%)	
Total	145	61	206	

*p< 0.050

Table 9
Multivariate Analysis Result

Independent Variable	Sig.	Exp(β)	95% C.I for Exp (β)	
			Lower	Upper
Gender	0.067	1.951	0.954	3.991
Fluid Intake	0.086	2.671	0.871	8.186
Constant	0.000	0.110		

DISCUSSION

F&V consumption is important to increase the body's immune system, especially during the covid-19 pandemic which must be consumed more. However, the situation in Indonesia during pandemic is not much different from the normal situation, which tends to be less than the recommended amount. The current pandemic situation causes activity restrictions and economic instability which can be one of the factors for limited access to fruits and vegetables, this also stated by Laborde et. al, (2020) that the current state of pandemic affected food security including food accessibility through decrease of income resulting in decrease of ability to buy foods.[28] Litton and Beavers' study also reported food-insecure respondents consumed fruits and vegetables fewer times per day than food-secure respondents and were more likely to report decreasing their consumption of any type of fruits and vegetables (total, fresh, frozen, and canned) since the pandemic started.[29]

The average of F&V consumption among teenagers was 132.43 g/day, lower than the daily requirement and lower than the finding of the Individual Food Consumption Survey in

2014.[13] The frequency of F&V consumption is 0.64 times/day for fruit and 1.16 times/day for vegetable, lower than previous study in low-income countries (Bangladesh, India, Pakistan, Zimbabwe) with the average of vegetables consumption was 1.48 servings/day for the vegetable and 0.80 servings/day for the fruit.[30] The average dietary fiber intake is still very low (6 g/day), lower than daily requirement for girls (29 g/day) and for boys (37 g/day). This finding similar to previous study in the United States that reported the average adolescents' fiber intake was only 10.9 g/day.[31]

Table 7 shows F&V consumption that meet the recommendation is more common in boys, those who like F&V, have good F&V accessibility, have good parental role, and have a good level of F&V knowledge, but limited peers' role in term of consuming F&V. In our study, boys have better F&V consumption which is not in line with a study by Anggraeni & Sudiarti (2019) that found girls have higher average of F&V consumption.[15] Regarding preferences, we found similar finding with the studies by Muna & Mardiana (2019) and Rachman, et. al (2017) which showed good F&V consumption was found more in the group that like F&V.[14,16] Related to the role of parents and peers, our finding also in accordance with the findings of Anggraeni & Sudiarti (2019), respondents with good parental influence have a higher average F&V consumption.[15] Otherwise, our study found peers rarely encourage each other and rarely consume F&V when they were together, contradicted with the results of the Muna & Mardina's study (2019) that stated peers actually support teenagers to consume of F&V, Ziaei et. al also stated parental and peer supports are two important factors that affect adolescents' F&V intake and healthy eating habits. [14,32] In terms of F&V knowledge level in teenagers, the results are also similar to previous studies which showed that the proportion of teenagers with good F&V consumption was found higher in the group with good nutritional knowledge.[14,16] The results of statistical tests showed that there was a significant relationship between F&V consumption and F&V accessibility (p=0.016) which is in line with the study by Trofholz, et. al (2016) (*p*=0.04).[17] However, no significant relationship was found between F&V consumption and gender (*p*=0.303), preferences (*p*=1,000), role of peers (*p*=0.524), and level of knowledge (*p*=0.336).

Constipation occurred in 29.6 percent of teenagers. Table 8 shows that the proportion of teenagers who constipated is more common in girls, with low F&V consumption, low level of knowledge, fiber intake more than or equal to 6 g/day, fluid intake less than 2,100 ml/day, and drink prebiotic occasionally. This result is in line with previous study by Yurtdas, et. al (2020) that participants who experienced constipation tend to have lower F&V consumption and lower mean of total fluid intake, fluid consumption was known to increase the moisture content of the stool and reduce constipation.[21,33] Regarding the consumption of probiotic drinks, this study is in line with study by Thea, et. al (2020) that showed teenagers were more constipated in those who do not consume probiotics every day.[34] Furthermore, teenagers who constipated tend to have a low level of knowledge, which is also not in line with the study of Thea, et. al. (2020) where the proportion of constipation was higher in teenagers with moderate level of nutritional knowledge.[34] Statistical test showed significant relationship between constipation with gender (*p*=0.031) and fluid intake (*p*=0.046). On the other hand, there were no significant relationship between constipation and F&V consumption (*p*=0.081), knowledge (*p*=0.145), fiber intake (*p*=0.160), and consumption of prebiotic drinks (*p*=0.480).

There were some limitations in this study such as the data were collected through online questionnaire so we could not directly monitor each subject in the food recording process and relied on subject's honesty in filling out the forms, and we were not able to collect parental role data directly from the parents.

The use of the food record method for 5 consecutive days provided a better picture of the daily consumption of fruits and vegetables for teenagers, which was one of the strengths of the study considering that previous studies used the retrospective FFQ method.

CONCLUSION AND RECOMMENDATION

Conclusion

Most teenagers have moderate level of F&V knowledge, almost all teenagers with F&V consumption and fiber intake below the recommendations it may have an impact on

29.6 percent the occurrence of constipation. F&V intake was found significantly associated with F&V accessibility, while constipation was found significantly associated with gender and fluid intake. Gender was found to be the dominant factor of constipation.

Recommendation

It is recommended for the school to carry out continuous socialization to the students and parents about balanced nutrition especially the importance of consuming 3 – 5 servings of F&V a day. In the current pandemic situation, socialization can be done online such as video conferencing or through educational videos distributed to students and parents.

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